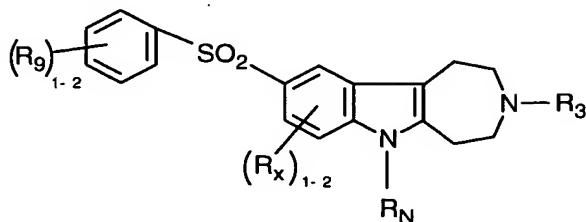


CLAIMS

1. An isotopically labeled compound of formula (X)



(X)

- 5 or a pharmaceutically acceptable salt or enantiomer thereof

wherein R_3 is:

- (1) -H,
- (2) C_1 - C_4 alkyl,
- (3) C_0 - C_4 alkyl- ϕ where ϕ is optionally substituted with up to 2 of the following:

- 10 (a) -F, -Cl, -Br, -I,
- (b) -OH,
- (c) -OC $_1$ - C_4 alkyl,
- (d) -CF $_3$,
- (e) -C \equiv N,
- 15 (f) -NO $_2$,

where R_N is:

- (1) -H,
- (2) C_1 - C_4 alkyl,
- (3) C_0 - C_4 alkyl- ϕ where ϕ is optionally substituted with up to 2 of the following:

- 20 (a) -F, -Cl, -Br, -I,
- (b) -O- R_{N-1} where R_{N-1} is -H, C_1 - C_4 alkyl, and ϕ ,
- (c) -CF $_3$,
- (d) -C \equiv N,
- (e) -NO $_2$,

- 25 where R_9 is:

- (1) -H,
- (2) -F, -Cl,
- (3) C_1 - C_4 alkyl,
- (4) C_1 - C_3 alkoxy,
- 30 (5) -CF $_3$,

(6) C₀-C₄ alkyl-φ where -φ is optionally substituted with up to 2 of the following:

- (a) -F, -Cl, -Br, -I,
- (b) -O-R_{9.1} where R_{9.1} is -H, C₁-C₄ alkyl, and -φ,
- (c) -CF₃,
- (d) -C≡N,
- (e) -NO₂,

(7) -OR_{9.1} where R_{9.1} is as defined above, and

wherein the compound of formula X has an isotopic label.

2. The compound of claim 1, wherein R₃ is -H and C₁-C₂ alkyl.

3. The compound of claim 2, wherein R₃ is -H.

4. The compound of claim 1, wherein R_N is -H and C₁-C₄ alkyl.

5. The compound of claim 4, wherein R_N is -H, methyl, and ethyl.

6. The compound of claim 1, wherein R₉ is -H, -F, -Cl, C₁-C₃ alkyl, C₁-C₃ alkoxy and -CF₃.

7. The compound of claim 6, wherein R₉ is -H, -F, -Cl, C₁ alkyl, C₁ alkoxy, and -CF₃.

8. The compound of claim 6, wherein the R₉ substituent is in the 3- or 4-position.

9. The compound of claim 1, wherein the isotopic label is Carbon-11, Nitrogen-13, or Oxygen-15.

10. The compound of claim 1, wherein the compound is:

9-(phenylsulfonyl)-1,2,3,4,5,6-hexahydroazepino[4,5-b]indole,

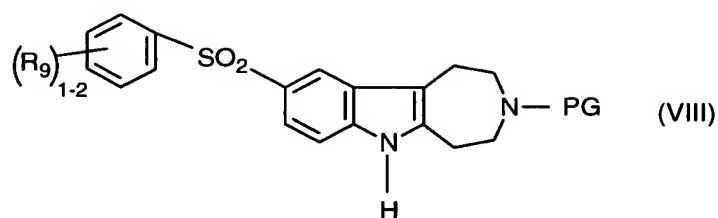
9-[(4-fluorophenyl)sulfonyl]-1,2,3,4,5,6-hexahydroazepino[4,5-b]indole,

6-ethyl-9-(phenylsulfonyl)-1,2,3,4,5,6-hexahydroazepino[4,5-b]indole, and

6-methyl-9-(phenylsulfonyl)-1,2,3,4,5,6-hexahydroazepino[4,5-b]indole, wherein

the compound has an isotopic label.

11. The compound of claim 1, wherein the compound is:
3,6-dimethyl-9-(phenylsulfonyl)-1,2,3,4,5,6-hexahydroazepino[4,5-b]indole, and
3-methyl-9-(phenylsulfonyl)-1,2,3,4,5,6-hexahydroazepino[4,5-b]indole, wherein
the compound has an isotopic label.
5
12. The compound of claim 1, wherein the compound is:
1-methyl-9-(phenylsulfonyl)-1,2,3,4,5,6-hexahydroazepino[4,5-b]indole,
2-methyl-9-(phenylsulfonyl)-1,2,3,4,5,6-hexahydroazepino[4,5-b]indole,
4-methyl-9-(phenylsulfonyl)-1,2,3,4,5,6-hexahydroazepino[4,5-b]indole,
10 5-methyl-9-(phenylsulfonyl)-1,2,3,4,5,6-hexahydroazepino[4,5-b]indole,
1,6-dimethyl-9-(phenylsulfonyl)-1,2,3,4,5,6-hexahydroazepino[4,5-b]indole,
2,6-dimethyl-9-(phenylsulfonyl)-1,2,3,4,5,6-hexahydroazepino[4,5-b]indole,
4,6-dimethyl-9-(phenylsulfonyl)-1,2,3,4,5,6-hexahydroazepino[4,5-b]indole, and
5,6-dimethyl-9-(phenylsulfonyl)-1,2,3,4,5,6-hexahydroazepino[4,5-b]indole,
15 wherein the compound has an isotopic label.
13. Method of performing diagnostic screening comprising: administering a compound
of claim 1 to a mammal for incorporation of the isotopically labeled compound into tissue
of the mammal.
20
14. The method of claim 13, wherein the compound is a detectably labeled compound
of formula X.
15. The method of claim 13, wherein the diagnostic screening is positron emission
25 tomography.
16. The method of claim 13, wherein the diagnostic screening is single photon emission
computed tomography.
- 30 17. A protected 9-arylsulfone of formula (VIII)



or a pharmaceutically acceptable salt or enantiomer thereof

wherein PG is:

- (1) $\phi\text{-CH}_2\text{-}$,
- 5 (2) $\phi\text{-CO-}$,
- (3) $\phi\text{-CH}_2\text{-CO}_2\text{-}$, and
- (4) $\text{-CO-O-C(CH}_3)_3$;

where R_N is:

- (1) -H,
- 10 (2) $\text{C}_1\text{-C}_4$ alkyl,
- (3) $\text{C}_0\text{-C}_4$ alkyl- ϕ where ϕ is optionally substituted with up to 2 of the following:
 - (a) -F, -Cl, -Br, -I,
 - (b) -O- R_{N-1} where R_{N-1} is -H, $\text{C}_1\text{-C}_4$ alkyl, and ϕ ,
 - (c) -CF₃,
 - 15 (d) -C \equiv N,
 - (e) -NO₂;

where R_9 is:

- (1) -H,
- (2) -F, -Cl,
- 20 (3) $\text{C}_1\text{-C}_4$ alkyl,
- (4) $\text{C}_1\text{-C}_3$ alkoxy,
- (5) -CF₃,
- (6) $\text{C}_0\text{-C}_4$ alkyl- ϕ where ϕ is optionally substituted with up to 2 of the following:
 - (a) -F, -Cl, -Br, -I,
 - 25 (b) -O- R_{9-1} where R_{9-1} is -H, $\text{C}_1\text{-C}_4$ alkyl, and ϕ ,
 - (c) -CF₃,
 - (d) -C \equiv N,
 - (e) -NO₂,
 - (7) -OR₉₋₁ where R_{9-1} is as defined above,

30 wherein the compound of formula X has an isotopic label.